Kinematics of roller chain drives - Exact and approximate analysis - DTU Orbit (08/11/2017)

Kinematics of roller chain drives - Exact and approximate analysis

An exact and approximate kinematic analysis of a roller chain drive modeled as a four-bar mechanism is presented. The span connects the sprockets such that they rotate in the same direction, and the sprocket size, number of teeth, and shaft center distance can be arbitrary. The driven sprocket angular position, velocity and acceleration, as well as span length, are calculated and their (discontinuous) variation with driver angular position and main design parameters is illustrated. Kinematic predictions for the chain span motion are compared to results of multibody simulation, and there is seen to be very good agreement. All together this gives new insights into the characteristics of chain drive kinematics and the influence of main design parameters.

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